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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Frederic Loras

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EXAMINER

FINDLEY, CHRISTOPHER G

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,326	Applicant(s) LORAS ET AL.	
	Examiner CHRISTOPHER FINDLEY	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 4 and 7 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 4 and 7 are directed to a software module, wherein according to the Applicant's Specification, page 8, lines 2-6, "The software module can be stored in or transmitted by a data medium. That medium may be a hardware storage medium, for example a CD-ROM, a magnetic disc or a hard disc, or **a transmissible medium, such as an electrical, optical, or radio signal.**" (emphasis added) A transmissible medium, such as an electrical, optical, or radio signal are each non-statutory, and therefore the claimed software module is non-statutory as well.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al. (US 7386048 B2, hereinafter referred to as "Sun").**

Re **claim 1**, at the time of the invention there had been a recognized problem or need in the art to reduce the memory required for performing predictive video coding. Traditional schemes, such as MPEG-2, relied on intra-frame and inter-frame encoding. The intra-frame (I) was encoded on a block by block basis by performing a frequency transform of the pixel values, quantizing the transform coefficients, and generating code-words from the quantized values. In order to reduce the size of the data stream,

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inter-frame prediction was introduced, wherein predictive frames (P) and (B) were encoded re-using redundant data. These prediction techniques saved large amounts data, and in turn memory. Therefore, when developing MPEG-4, prediction techniques were introduced into the intra-frame, wherein blocks are predicted from adjacent blocks. In order to perform this intra prediction, the direction from which the data is being interpolated must be determined.

Sun teaches methods and systems for image intra-prediction mode organization. According to Sun, the direction of prediction can be identified as one of nine directions (Sun: columns 3 and 4, modes 0-8). Accordingly, Sun discloses performing an ordering process, wherein the direction which produces the least prediction error is determined (Sun: column 4, lines 43-46). Sun further discloses that the best order of modes may be different in certain situations, as in for blocks that do not border discontinuities such as image edges or swipe/swath boundaries (Sun: column 5, lines 42-52), or blocks near edges or boundaries or where adjacent block or pixel prediction mode data is not available (Sun: column 5, lines 53-63). Sun also goes on to show several embodiments with different mode orders (Sun: column 5, line 64-column 6, line 51), but further states that the mode order may vary beyond these exemplary orders (Sun: column 6, lines 52-54) and the order may be significantly changed if desired (Sun: column 6, line 55-column 7, line 2).

Sun does not explicitly disclose the method calculating virtual blocks associated with said current block in given prediction directions, wherein method comprises the following steps: selecting two initial prediction directions (E, S) from the given prediction directions, calculating virtual blocks associated with said initial prediction directions (E, S), comparing said virtual blocks with the current block and selecting the initial prediction direction (E) that minimizes the difference between the associated virtual block and the current block, which prediction direction is then called the first main direction, calculating virtual blocks associated with the prediction directions (ENE, ESE) immediately adjacent to said first main direction (E), comparing the virtual blocks associated with the first main direction (E) and said immediately adjacent directions (ENE, ESE) with the current block to determine the best prediction direction, which is the prediction direction that minimizes the difference between the associated virtual block and the current block, if said best prediction direction is said first main direction (E) or one direction (ENE) of the

immediately adjacent directions if it is situated at one extremity of the set of prediction directions, deciding this best direction is the required prediction direction, otherwise, selecting the prediction direction (ESE) that minimizes the difference between the associated virtual block and the current block, which is then called the second main direction, calculating the virtual block associated with the prediction direction (SE) other than the first main direction (E) that is immediately adjacent to the second main direction (ESE), comparing the virtual blocks associated with the second main prediction direction (ESE) and with said immediately adjacent direction (SE) with the current block to determine the best prediction direction, which is the prediction direction that minimizes the difference between the associated virtual block and the current block, if said best prediction direction is said second main direction (ESE) or the immediately adjacent direction (SE) if it is situated at one extremity of the set of prediction directions, deciding that best direction is the required prediction direction, otherwise, continuing the process iteratively until the required prediction direction is found.

However, as discussed above regarding the disclosure of Sun, there are a finite number of prediction directions, and therefore a finite number of identified and predictable potential mode orders. In view of Sun's disclosure that the mode order may be reordered and the finite number of possible mode orders, one of ordinary skill in the art at the time of the invention could have pursued the known possible mode orders with a reasonable expectation of successfully finding the optimal order for particular coding situations. Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

Re **claim 2**, Sun does not explicitly disclose that iteration is stopped if the best current prediction direction (SE) is adjacent to a direction (SSE) immediately adjacent to the initial direction (S) not retained as the first main direction. However, as discussed above for claim 1, it would have been obvious to one of ordinary skill in the art at the time of the invention to iteratively try every possible mode ordering in order to find the best mode order for particular coding situations. Therefore, one of ordinary skill in the art at the time of the invention would have found it obvious that one of the iterations would end with the prediction modes following the order claimed.

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Re **claim 3**, Sun discloses that said initial prediction directions are vertical and horizontal directions as defined in the H.264/MPEG-4 AVC standard (Sun: Sun: column 5, line 64-column 6, line 51, initial directions are horizontal and vertical; column 4, lines 59-60, the modes conform to the JVT standard, wherein the Joint Video Team (JVT) of ISO/IEC developed the H.264/MPEG-4 AVC standard).

Re **claim 4**, Sun discloses a software module for a coding device containing software instructions for commanding the execution by the coding device of the steps of the method according to claim 3 (Sun: claim 7).

Re **claim 5**, Sun discloses a coding device comprising the software module according to claim 8 (Sun: claim 5).

Claim 6 has been analyzed and rejected with respect to claim 3 above.

Claim 7 has been analyzed and rejected with respect to claim 4 above.

Claim 8 has been analyzed and rejected with respect to claim 5 above.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is (571)270-1199. The examiner can normally be reached on Monday-Friday (8:30 AM-5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621

/Christopher Findley/